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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,840	10/24/2003	Rudolf M. Smaling	9501-70665	9235
23643	7590	04/20/2006		
BARNES & THORNBURG 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204			EXAMINER HANDAL, KAITLY V	
			ART UNIT	PAPER NUMBER

1764

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,840

Applicant(s)

SMALING ET AL.

Examiner

Kaity Handal

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 17-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-23 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/23/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 11-16, drawn to apparatus, classified in class 422, subclass 197R.
 - II. Claim 1-10 and 17-23, drawn to method, classified in class 48, subclass 131.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process as claimed can be practiced by another and materially different apparatus, one which does not require having a controller electrically coupled to air/fuel assembly.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

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During a telephone conversation with Mr. Shawn Bauer on 4/7/2006 a provisional election was made without traverse to prosecute the invention of group II, claims 1-10 and 17-23. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the step of sensing" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 10, 17-18, and 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Numata et al. (US 2002/0000067 A1).

With respect to claim 1, Numata teaches the method of operating a fuel reformer (fig. 1, 30) comprising the steps of: advancing a first air/fuel mixture with a first air-to-fuel ratio into the fuel reformer (30), and operate the air/fuel input assembly so as to advance a second air/fuel mixture (page 1, paragraph [0017], lines 7-15). Numata further teaches the method of determining if a soot purge of the soot trap/partition (34) is to be performed and generate a purge-soot signal in response thereto (page 2, paragraph [0024], lines 1-10).

With respect to claim 10, Numata teaches wherein the determining step comprises generating a high-load control/start-up signal when an engine associated with the fuel reformer experiences a high load condition, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to generation of the high-load/start-up control signal (page 3, paragraph [0033]).

With respect to claims 17 and 20, 22-23, Numata teaches a method of operating a fuel reformer (fig. 1, 30) comprising the step of: entrapping soot generated by the fuel reformer in a soot trap/partition (34), and advancing air, at a predetermined time

intervals, in the absence of fuel into the fuel reformer so as to combust soot present in the soot trap/partition (34) (page 2, paragraph [0024], lines 1-11).

Numata indirectly teaches the step of determining the amount of soot within the fuel reformer housing (30), wherein the advancing step comprises advancing air in the absence of fuel if the amount of soot within the fuel reformer housing is greater than or equal to a predetermined amount. Numata teaches having combusting soot at predetermined time intervals, and given that the predetermined time intervals are set based on the expected amount of soot that would accumulate in partition (34) over a time period, after which soot is removed by executing the soot removing routine at the predetermined time intervals (page 3, paragraph [0024], lines 13-18), therefore Numata does teach indirectly the step of determining the amount of soot within the fuel reformer housing (30).

With respect to claim 18, Numata teaches the step of advancing a mixture of fuel and air into the fuel reformer housing prior to the step of advancing air in the absence of fuel into the fuel reformer housing (page 2, paragraph [0023], lines 8-23).

With respect to claim 21, Numata teaches wherein the step of advancing air in the presence of fuel into the fuel reformer subsequent to completion of the step of advancing air in the absence of fuel (page 2, paragraph [0024], lines 12 – page 3, lines 1-4).

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer (US 2004/0050345 A1) and further in view of Smaling (US 2003/0200742 A1).

With respect to claims 1 and 5-6, 8, the method of operating a fuel reformer comprising the steps of: advancing a first air/fuel mixture with a first air-to-fuel ratio into the fuel reformer (page 2, paragraph [0016], lines 9-19), and operating the air/fuel input assembly so as to advance a second (or third) air/fuel mixture having a second air-to-fuel ratio greater than the first air-to-fuel ratio into the fuel reformer (page 2, paragraph [0022]).

Bauer fails to show determining if a soot purge of the soot trap/emission abatement device (24) is to be performed and generate a purge-soot signal in response thereto. Smaling teaches an apparatus (fig. 4) for regenerating a soot particulate filter (76) comprising a reformer/plasmatron (54), a controller (100) and an emission abatement device (52) which utilizes pressure sensors (104) in order to determine when the filter assembly requires regeneration (page 5, paragraph [0042], lines 1-6) in order to regenerate the soot particulate filter (76) (page 5, paragraph [0045], lines 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the controller in Bauer's apparatus to cause said

processing unit to determine if a soot purge of the soot trap/emission abatement device (24) is to be performed and generate a purge-soot signal in response thereto, as taught by Smaling, in order to regenerate the soot particulate filter.

With respect to claims 2-3, Smaling further teaches wherein the step of sensing the amount of soot comprises a pressure sensor/(which directly is a function of the amount of soot within the soot trap) sensing the pressure drop across the soot trap, and generating a pressure-reached control signal when the pressure drop across the soot trap reaches a predetermined level, and operating the air/fuel input assembly to advance the second air/fuel mixture in response to generation of the pressure-reached control signal (page 5, paragraph [0045]).

With respect to claim 4, Smaling further teaches wherein the step of advancing the second air/fuel mixture includes advancing second air/fuel mixture for a predetermined period of time to purge the fuel reformer (page 5, paragraph [0046], lines 10-13).

With respect to claim 7, Smaling further teaches wherein the determining step comprises determining if a predetermined period of time has elapsed since soot was last purged, and generating a time-lapsed control signal in response thereto, and advancing the second air/fuel mixture in response to generation of the time-lapsed control signal (page 5, paragraph [0046], lines 10-13).

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9. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numata et al. (US 2002/0000067 A1), as applied to claims 1 and 17, and further in view of Christen et al. (US 2003/0039871 A1).

With respect to claims 9 and 19, Numata discloses all claim limitations as set forth above but fails to show wherein the determining step comprises detecting a reformer shutdown request control signal, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector. Christen teaches controlling a fuel cell reformer system (fig. 2) wherein the system is configured such that controller (40) controls the flow of fuel via valve (34) and air via valve (33) into a reformer (16) (page 2, paragraph [0026]), and wherein shutdown comprises advancing air/fuel/water mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector/valve (34) in order to allow possible soot deposits to be burned off (page 2, paragraph [0019], lines 1-4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to advance the second air/fuel mixture in response to detection of the reformer shutdown request control signal and ceasing operation of a fuel injector in Numata's apparatus, as taught by Christen, in order to allow possible soot deposits to be burned off.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH

4/7/2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER